SKIN HEIFER TAP TECHNIQUE VERSUS CRYOTHERAPY ON PAIN REDUCTION DURING IM INJECTION

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ABSTRACT

The most frightening effect of Intramuscular (IM) injection that is the pain which is a major barrier in ensuring patient comfort is now under study to find an alternate way of management. And this present study is with the aim of comparing two such non-pharmacological methods namely Heifer skin tap technique (HSTT) and Cryotherapy in a selected hospital, Idukki, Kerala. Methods and materials: A qualitative approach with two experimental groups and a control group and posttest only design was used. Purposive sampling technique was used. Out of 90 samples, 30samples for each group assigned. Researcher evaluated the posttest pain using a standardized Numerical Rating Scale (NRS). The results were the posttest mean pain score during IM injection for control and experimental group I after receiving Helfer skin tap technique (1.33± 2.397, t=3.046 df 29) and control and cryotherapy group (2.433± 3.212, t=4.148,df 29), HSTT group and Cryotherapy group (2.578±1.100, t=2.337, df 29). The study also found that there were significant association with pain and few selected variables including site of injection (λ^2= 10.64, df =3 in control, 10.788, df 3 in HSTT group), position of patient (λ^2=9.592, df 3 in control, 11.868, df 3 in HSTT group, 8.14, df 3 in cryo group), amount of injection (λ^2=15.950, df=6 in Cryo group). The present study suggested that cryotherapy is more effective in reducing IM injection pain than Heifer skin tap technique.

Keywords: *Pain, Heifer Skin Tap Technique, Cryotherapy, IM Injection*

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INTRODUCTION

Pain is a multi-dimensional phenomenon, which emphasis people seek health care in their major concern of life. Each person feels differently and express differently because pain is a subjective feeling. Every human has the right to protect their own health and free from painful distress and sufferings without delay. Pain management is the *"fifth vital sign"* defined by American Pain Society, which enhance its importance and public awareness regarding effective pain management in their life. Administration of medication is the main caption in the care, treatment and prevention of illness and promotion of health. These medications can be given through oral, intravenous, intramuscular, intra-thecal, inhalation, nebulization or topical application. 96% of all Intramuscular injections given by private sectors are antibiotics, analgesics and vaccines. (Gyanedri T, 2019).

Intramuscular injection is the introduction of medication parenteral through skin puncture by sharp needle in to the deep muscles for therapeutic and curative purpose. IM injection is an invasive procedure, routinely performed in deltoid, vastus lateralis or gluteal muscles which give painful discomfort to an individual. Most of the medication giving through IM, is sedatives, antipsychotics, hormones and vaccines. Drug absorption takes place faster from the muscles because of rich vascular supply in the site.

Intramuscular injection can result pain, redness, swelling around the site, which can last for few or more days. Certain factors can contribute these difficulties due to type and volume of medication, position and site of the patient, size and length of the needle, and the way of administering medication by the health practitioner. Preventing and relieving pain and discomfort is considered as the basic human right. There are variety of non-pharmacological approaches are gaining popularity in modern era. Certain measures like cry therapy, vulsalva maneuver, hot application, skin heifer tap techniques, diversion and manual pressure applications are some of the interventions are safe and easy to perform by the health care providers. Nurses have a crucial role to select an appropriate method to perform wisely to reduce pain and discomfort especially those who are having needle phobia. (Ruma Choudhary et al, 2020).

Heifer Skin Tap technique was introduced by Joanne Keiffer Heifer in1998. In this method, giving rhythmic taping for six times over the injection site by using palm before and after needle insertion to relax muscles and reduce pain perception on the basis of Gate Control Theory. Skin taping promotes mechanical stimulation to the muscle fibers, thus activate the interneurons results muscle relaxation and arrest pain impulse transmission towards brain. And it promotes diversion of mind while inserting the needle to the site. Many studies supported the effect of HSTT on pain reduction during IM injection with statistical evidence (Sefika D, 2020).

Cryotherapy or localized freezing is safe, pain free and easy to perform; non- invasive technique which decreases the velocity of nerve fibers leads diminished pain impulse transport to the brain. Number of studies explained the effect of cryotherapy on reduction of pain perception, control muscles spasm, inflammatory injuries and chronic diseases. (Ewa R, 2019). Few more recent reviews strengthen the effect as anti-inflammatory, anti-analgesic and antioxidant action (Giovanni et al, 2017).

PROBLEM STATEMENT

"A study to assess the efficacy of Helfer skin tap technique Versus Cryotherapy on pain reduction during IM injection among patients in selected Hospital, Idukki, Kerala".

OBJECTIVES

1. To assess the level of pain during IM injection in control group, experimental group-I and experimental group-II.
2. To compare the post-test level of pain between control group, experimental group-I and experimental group-II.
3. To find out the association between the level of pain and selected demographic and clinical variables.

Hypotheses

H_1: There is a significant difference between posttest level of pain during IM injection control group, experimental group-I and experimental group-II after intervention.

H_2: There is a significant relationship between the level of pain and selected demographic and clinical variables.

REVIEW OF LITERATURE

Sefika Dilek (2020) conducted a randomized trial on effect of Skin heifer tap technique on IM pain reduction in adults. Data was collected and analyzed by using SPSS Version 20. Results shows the mean score was less in experimental group (0.18±0.39) than control group(2.88±1.02) and it was statistically significant.($p<0.05$)

Vathani et al (2017) conducted a study to assess the effect of heifer skin tap technique on pain reduction during IM injection. 134 samples were selected based on inclusion criteria and randomized trial was used.

With simple random sampling techniques selected samples data was collected and analyzed. Post test score of pain in both group was highly significant.(0.67±1.17 vs. 4.95 ±1.77) at the level of p< 0.001. **Abhija PV (2015)** conducted a study to evaluate the effect of skin heifer tap technique on pain reduction during IM injection among adults in n Coimbatore with 100 samples were selected with convenient sampling technique. A quantitative approach was used and one group pretest and posttest were applied. In post test score 25% had no pain and 75% had mild pain, where as 63% had moderate and 37% had severe pain in pretest. Mean difference=4.8 and it was statistically significant (t=54.02, p<0.05).

Uma Neupane, (2019) another quasi-experimental study was conducted on the effect of skin heifer tap technique on pain reduction on IM, with 80 adults selected by purposive sampling and posttest only design was applied. Results were 67.5% had moderate and 32.55% had mild in intervention group and 77.5% had moderate, 17.5% had severe pain in control group. Therapy was effective and highly significant.(t=4.292, p<0.01). **Muthlekshmi et al (2019**) conducted a comparative study on the effect of HSTT Vs. conventional techniques on pain reduction on IM injection. By using convenience sampling 60 samples were selected. Results shows HSTT was effective and significant.(t= 5.917, p <2.000).

G Bhuvaneswary et al (2018) conducted a study on the effect of SHTT on pain perception during IM injection. 60 samples were selected by simple random sampling techniques. In an experimental group had 56.66% moderate level and 10% had severe pain? In control 60% had moderate and 26.66% had severe pain. It shows statistically significant (t=7.53, p<0.05). **Ramachoudhary B (2019)** performed a quasi-experimental study to evaluate the effect of cryotherapy on pain reduction during IM injection in Gurgaon with 60 samples. Data results showed it was highly effective and statistically significant.(0.93±31.20), (3.5±1.97) at the level p<0.001.

Another quasi experimental study conducted by **RH Ramadan(2016**), to evaluate the efficacy of Cryotherapy in pain reduction on IM procedure pain and results proved among 100 samples, therapy was effective and highly significant in statistically.(p<0.05). **R Mohammad (2019)** performed a quasi-experimental study to assess the effect of cryotherapy on IM pain perception among 80 adults and data revealed that it was effective and statistically proved.(p<0.05). **H Rasha (2016)** conducted an experimental study to evaluate the effectiveness of cryotherapy versus shin heifer tap technique to reduce pain during IM insertion, 50 each samples were located in both groups and collected data was analyzed with SPSS version 20. Results shows mean difference was high and statistically significant.(p<0.001)

METHODOLOGY

A **quantitative research** approach and **quasi experimental posttest only design** was performed. Total of **90** samples, 30samples each for both experimental and control groups assigned by **non-probability, purposive sampling** technique used based on inclusion and exclusion criteria. After gaining prior permission from concerned authority, clinical and demographic data was collected followed by informed consent from each participant. Tool consisted of two parts. Part 1 includes Self structured questionnaire for clinical and demographic variables and part 2 consist of NRS scale for pain assessment were implemented. Coding and tabulation was done by using SPSS version 20.

Figure 1: Frequency and percentage distribution of posttest level of pain in control, experimental group 1 and group II.

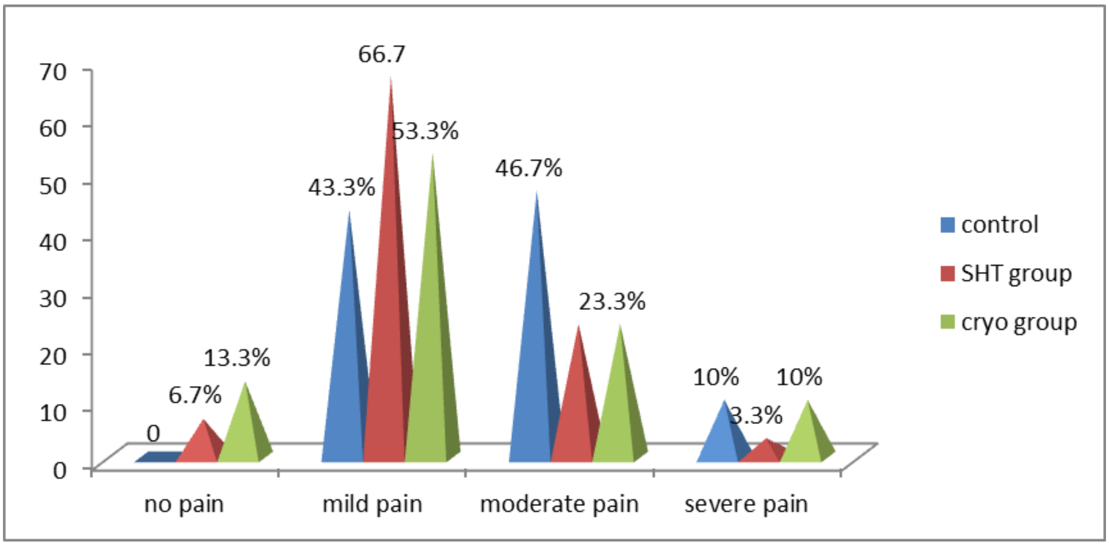

Table 1: Distribution of samples based on selected variables

S. No	Variables	Control group (n= 30)		Cryotherapy group. (n=30)		SHTT group (n=30)	
		F	%	F	%	F	%
1	**Age:** 18-35 years	19	63.3	19	63.3	16	53.3
	36-50years	7	23.3	9	30	12	40
	>51 years.	4	13.33	2	6.7	2	6.7
2	**Gender:** Male	12	40	11	36.7	12	40
	Female	18	60	19	63.3	18	60
3	**Area of living**: Urban	11	36.7	8	26.7	2	6.7
	Semi urban	8	26.7	11	36.7	18	60
	Rural	11	36.7	11	36.7	10	33..3
4	**Type of diet**: Vegetarian	2	6.7	2	6.7	3	10
	Non-vegetarian	28	93.3	28	93.3	27	90
5	**Habits:** Alcohol	2	6.7	2	6.7	2	6.7
	Smoke	5	16.7	4	13.3	3	10
	Both	3	10	3	10	5	16.7
	Nil	20	66.7	21	70	20	66.7
6	**Level of Exercise**						
	Regularly	2	6.7	1	3.3	2	6.7
	Occasionally	9	30	9	30	7	23.3
	Nil	19	63.3	20	66.7	21	70
7	**BMI:** Under-nourished	3	10	3	10	7	23.3
	Nourished	21	70	21	70	21	70
	Obese	6	20	6	20	2	6.7
8	**Site of injection**:						
	Gluteal	19	63.3	20	66.7	16	53.3
	Deltoid	11	36.7	10	33.3	14	46.7
9	**Position of the patient**						
	Lying	20	66.7	21	70	16	53.3
	Sitting	10	33.3	9	30	14	46.7
10	**Type of injection**						
	Vaccines	8	26.7	7	23.3	12	40
	Pain killers	17	56.7	19	63.3	15	50
	Others	5	16.7	4	13.3	3	10
11	**Amount of injection:**						
	0.5ml	5	16.7	5	16.7	12	40
	1.0 ml	12	40	13	43.3	15	50
	2.0 ml	13	43.3	12	40	3	10

Table 2: Comparison of mean, standard deviation among control group, Experimental group I and II.

Variables	Mean	SD	Mean	SD	Mean	SD
Age	32.80	10.012	38.20	17.061	32.70	11.148
Height	160.07	6.378	159.23	4.688	159.90	5.579
Weight	61.07	9.307	61.90	10.223	58.27	7.777
Respiration Before	20.60	1.754	21.93	1.929	21.13	1.456
Respiration After	21.20	1.864	21.53	1.634	21.13	1.252
Pulse Before	76.07	8.346	80.13	8.709	74.40	6.956
Pulse After	76.47	8.415	78.47	7.234	72.07	11.368
BP Before	126.53	17.300	127.33	16.174	124.33	13.817
BP After	127.93	16.646	127.67	15.687	126.60	11.711

Table 3: Association between level of pain and selected demographic and clinical variables

S. No	Variables		Control group		SHT group		Cryogroup	
		df	t value	λ^2 Value	t value	λ^2 Value	t value	λ^2 Value
1	Age	3	7.82	3.469	7.82	4.038	12.59	**18.28**
2	Gender	3	7.82	2.695	7.82	2.217	7.82	.751
3	Type of diet	3	7.82	1.014	7.82	1.102	7.82	1.034
4	Habits	6	12.59	2.184	12.59	2.374	16.92	4.594
5	BMI	6	12.59	6.467	12.59	6.078	12.59	2.592
6	Site of injection	3	7.82	10.64	7.82	10.788	7.82	7.540
7	Position	3	7.82	9.592	7.82	11.868	7.82	8.141
8	Type of injection	6	12.59	12.89	12.59	17.623	12.59	14.00
9	Amount of injection	9	16.92	15.83	16.92	11.703	12.59	15.950
10	Level of exercise	3	7.82	1.684	7.82	3.489	7.82	2.880

Table 4: Comparison of mean, Standard Deviation and Paired 't' test on post-test pain level among Experimental group I and Experimental group II .

S.No.	Paired Group	Paired 't' test					't' value	df	Sig. (2-tailed)
		Mean	SD	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
1.	NRS of control X Heifer group	1.333	2.397	.438	.438	2.229	3.046	29	.005
2.	NRS of control X Cryo group	2.433	3.213	.587	1.234	3.633	4.148	29	.000
3.	Heifer group X Cryo group	1.100	2.578	.471	.137	2.063	2.337	29	.027

DISCUSSION

The findings of the present study reveals that in the experimental group I after receiving HSTT 66.7% patients had mild pain and 23.3% had moderate pain, which is supported by a study by Shajitha, (2017) in which 92% had mild pain and 8% had moderate pain.

In experimental group II after receiving cryotherapy 53.3% had mild and 23.3% had moderate level of pain. Where as in control group 46.7% had moderate and 10% had severe Pain during IM injection. Supported another study by Jayashree, (2016) at Madurai obtained the result that 87% had mild, 13% had moderate pain. In this present study the mean post test score of SHTT group I was 1.333with SD 2.397and that of cryo group 2.433with SD 3.213. In control group 2.578 and SD 1.100. By using independent sample t-test, it was statistically proved (t=3.046, 4.148, 2.337, df 29) at the level of ($p<0.05$). These study findings were supported by number of research findings. GyanJyothi, (2018) says HSTT was effective (mean±1.13, ±5.63, $p<0.001$), S.Kaur (2019) says HSTT was more effective (3.96±1.16, 2.56 ±1.57) in IM pain reduction.

In this study site of injection (x^=10.64, df=3), position of site (9.592, df 3) and type of injection (12.89, df 6) have an association with pain in control group. HST tech group had an association with pain and site of injection (10.788, df 3) and type of injection (17.623, df 6). In Cryo group had association with pain on position of site (8.14, df 3) type of injection (14.00, df 6) and amount of injection (15.950).

CONCLUSION

Out of many non-pharmacological approaches, Cryotherapy and Heifer Skin tap technique was effective method to reduce pain perception during intramuscular injection. The present study findings highlight the effectiveness of SHTT and Cryotherapy. Both are acceptable methods for nurses to perform safely to reduce pain perception for patient with needle phobia.

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